Colorado Basin River Forecast Center Stakeholder Forum

Beyond The Streamflow Forecast

What is affecting short term forecasts

Tracking conditions within the River Basin

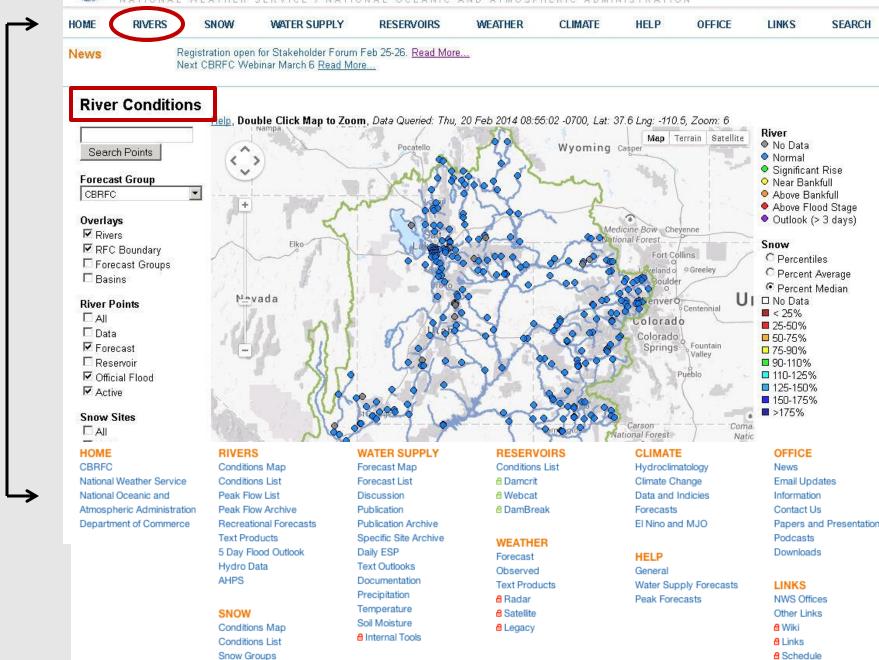
Seasonal discussions / Seasonal trends

CBRFC
Web Page
Navigation

Providing the most pertinent information

Future Improvements (keeping it simple yet informative)

COLORADO BASIN RIVER FORECAST CENTER



6 Old SDM

COLORADO BASIN RIVER FORECAST CENTER

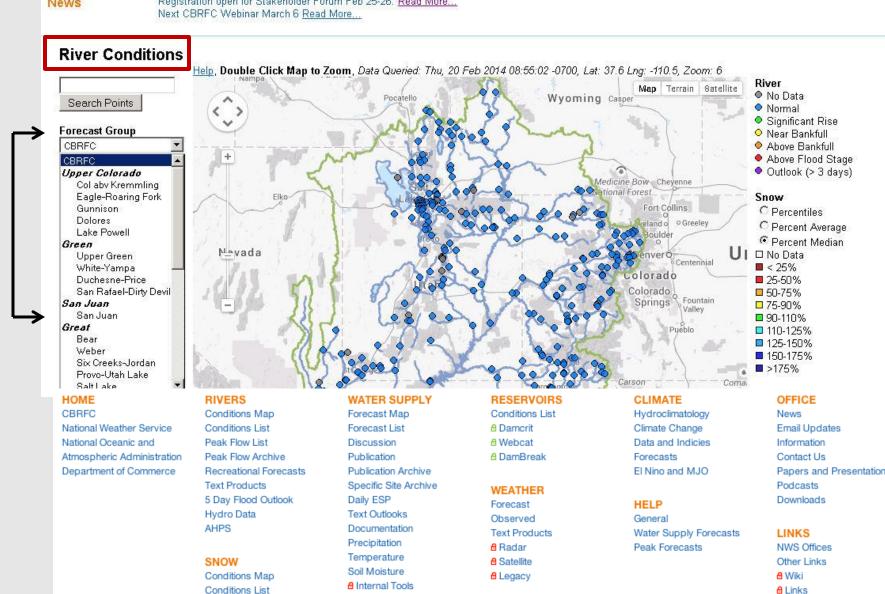
NATIONAL WEATHER SERVICE / NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

HOME RIVERS SNOW WATER SUPPLY RESERVOIRS WEATHER CLIMATE HELP OFFICE LINKS SEARCH

News

Registration open for Stakeholder Forum Feb 25-26. Read More...

Snow Groups



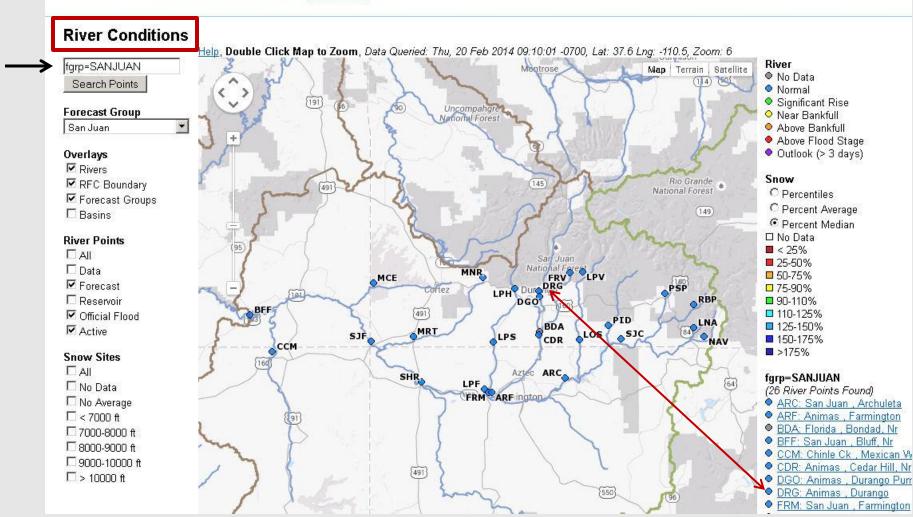
Schedule ∃ Old SDM



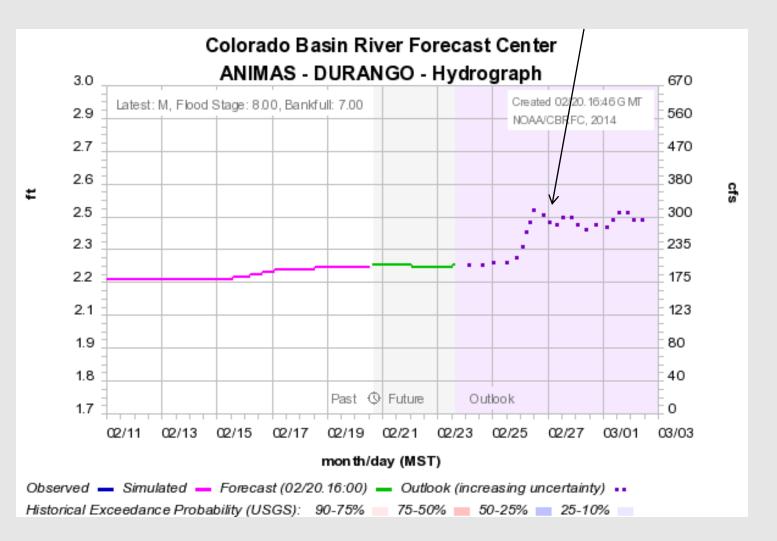
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Future Rise – Precipitation ? Temperature ? Upstream Regulation ?



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CLIMATE

HELP

SEARCH

News

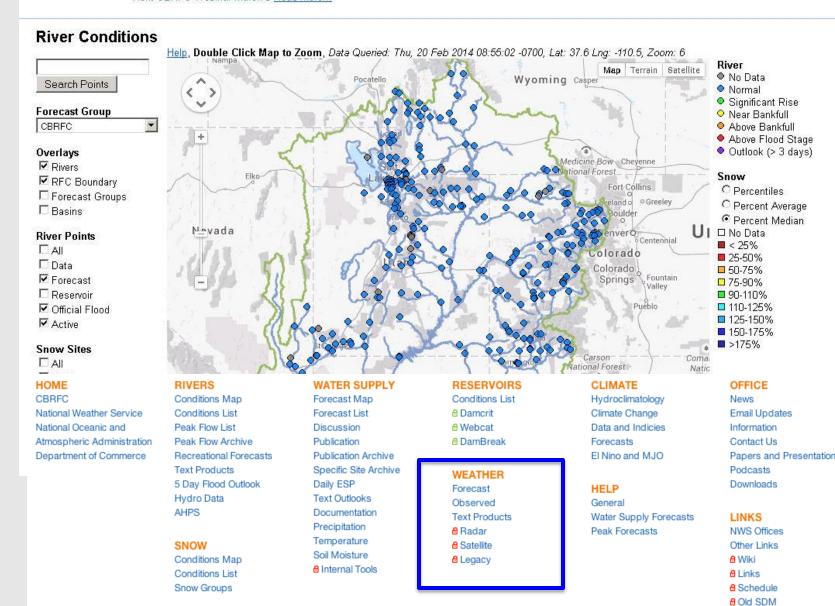
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WATER SUPPLY



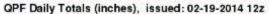
Quanitative Precipitation Forecast (QPF)

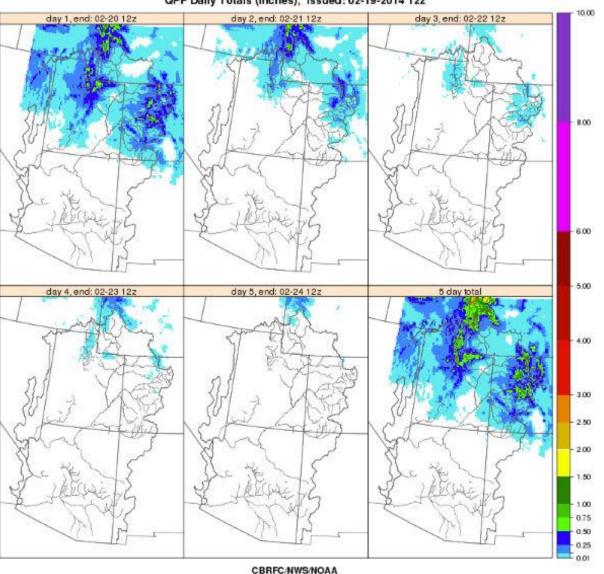
Forecast Type: Precipitation Temperature

Year: 2013 2014 Month: 01 02

Day: 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19

Duration: Daily 6 Hourly





Quanitative Temperature Forecast (QPF)

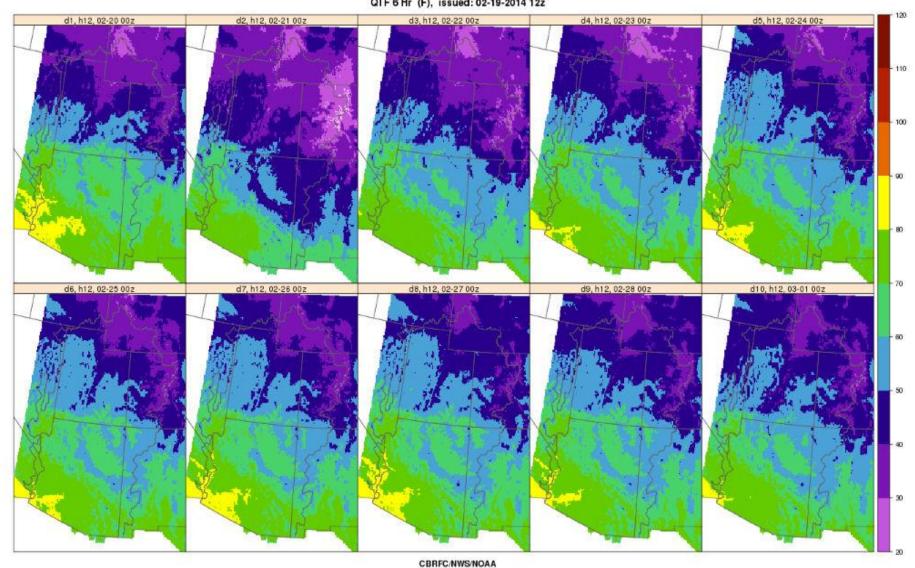
Forecast Type: Precipitation Temperature

Year: 2013 2014 Month: 01 02

Day: 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19

Hour: 6 12 18 24

QTF 6 Hr (F), issued: 02-19-2014 12z



Colorado Basin River Forecast Center Stakeholder Forum

Beyond The Streamflow Forecast

Tracking conditions within the River Basin

Precipitation (recent, monthly, seasonal)

Snow conditions (points, basins, comparison abilities)

Soil Moisture (Impacts to forecasts & runoff)

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HELP

SEARCH

News

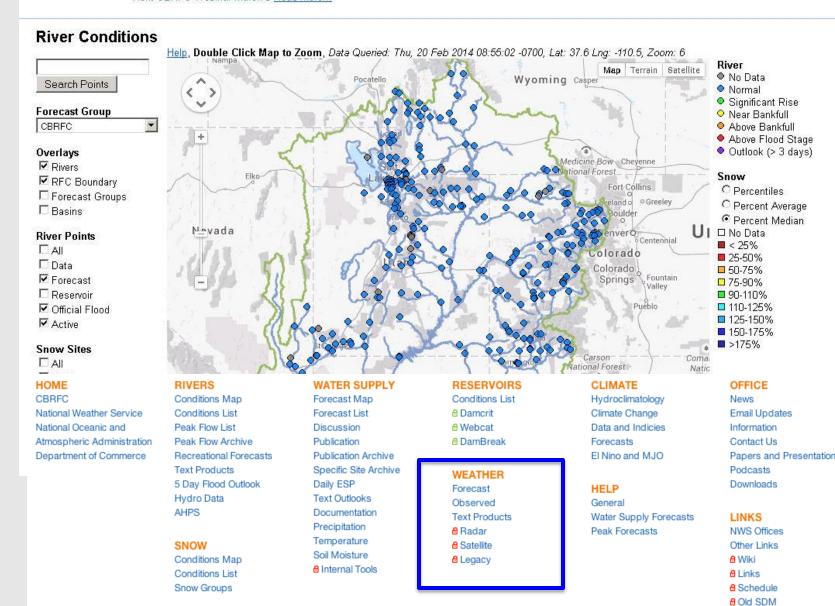
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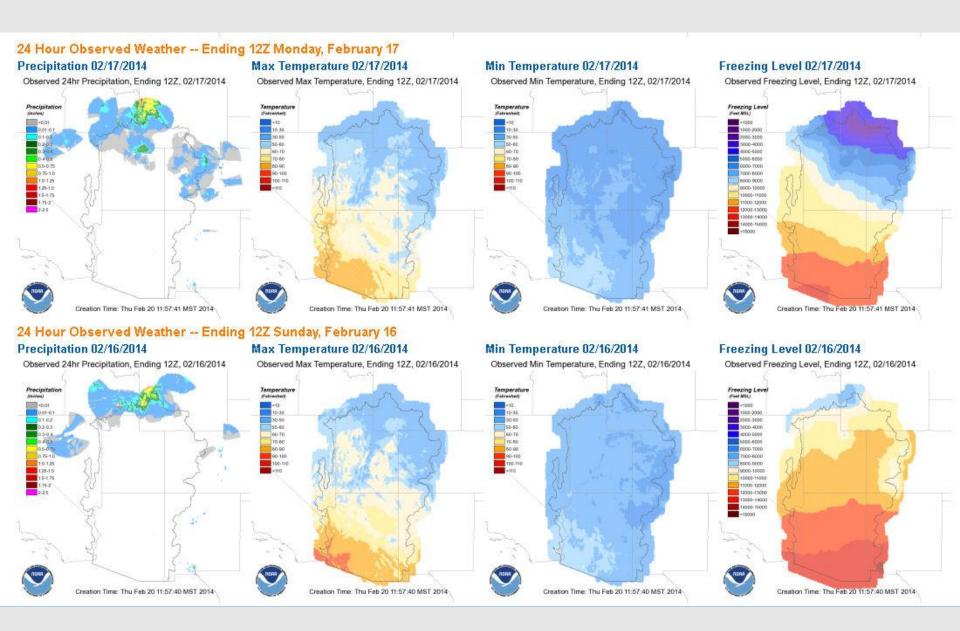
SNOW

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WATER SUPPLY



Recent Weather



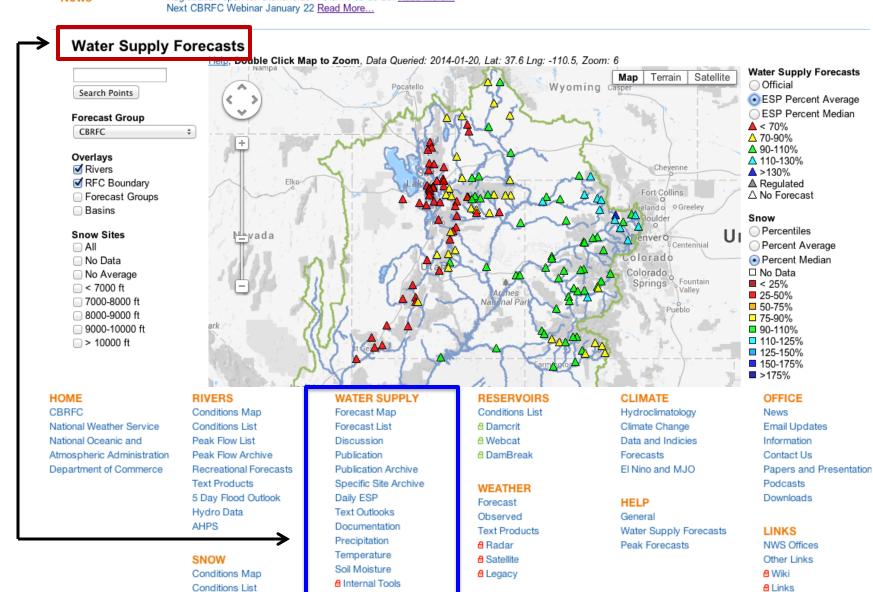
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WATER SUPPLY HOME **RIVERS** SNOW RESERVOIRS WEATHER CLIMATE **HELP OFFICE** LINKS SEARCH

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Snow Groups



Schedule

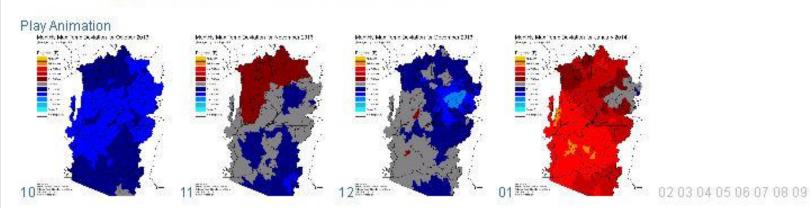
Old SDM

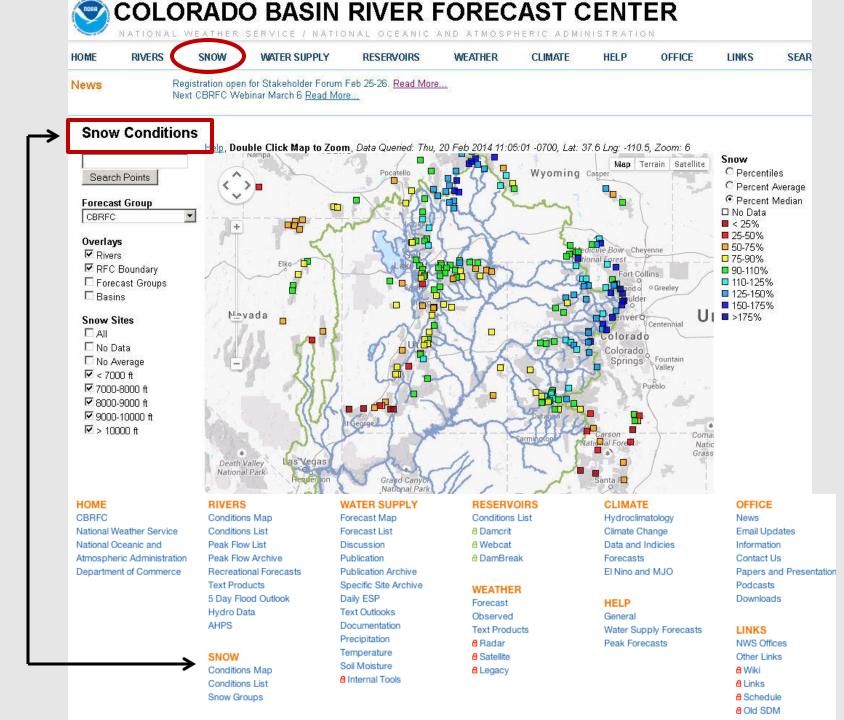
Precipitation Summaries - CBRFC - 2014 View Latest: Monthly | Seasonal Choose Area: CBRFC | Western US Choose Year: 2014 2013 2012 2011 2010 2009 2008 2007 2006 2005 2004 2003 2002 2001 2000 1999 1998 1997 1996 Monthly Play Animation Seasonal Play Animation Play Animation Play Animation Play Animation Play Animation Recomplete R

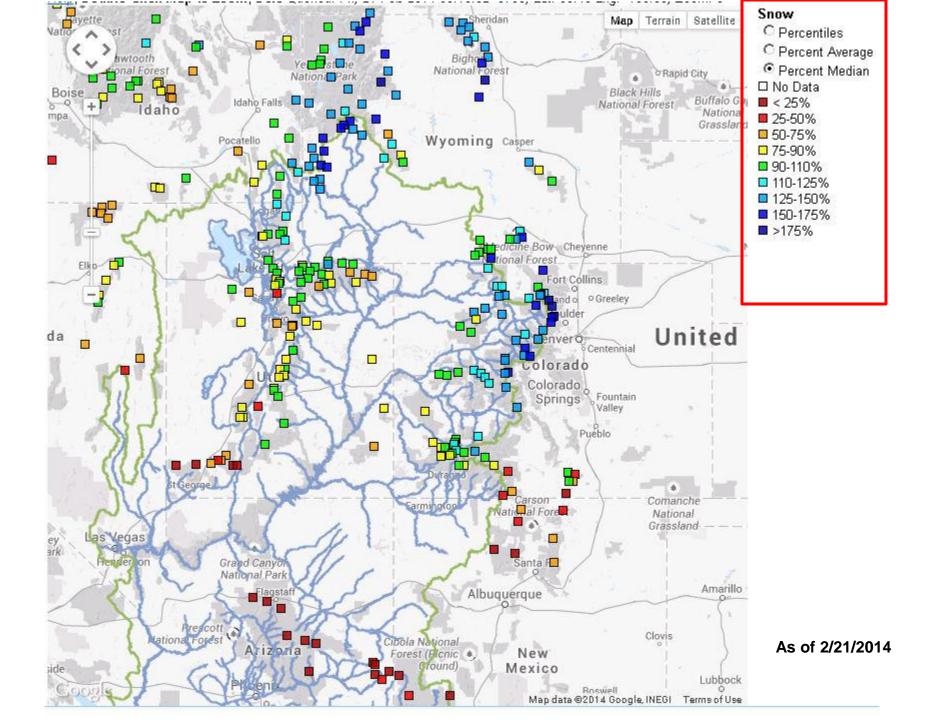
Maximum Temperature Deviation - CBRFC - 2014

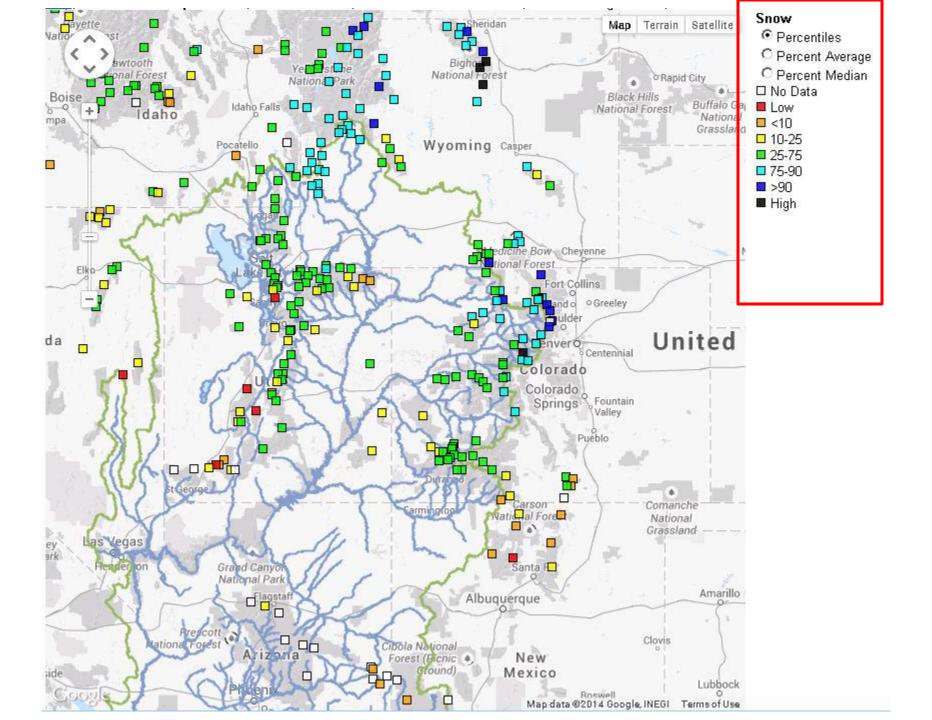
Choose Type: Max Temp Min Temp

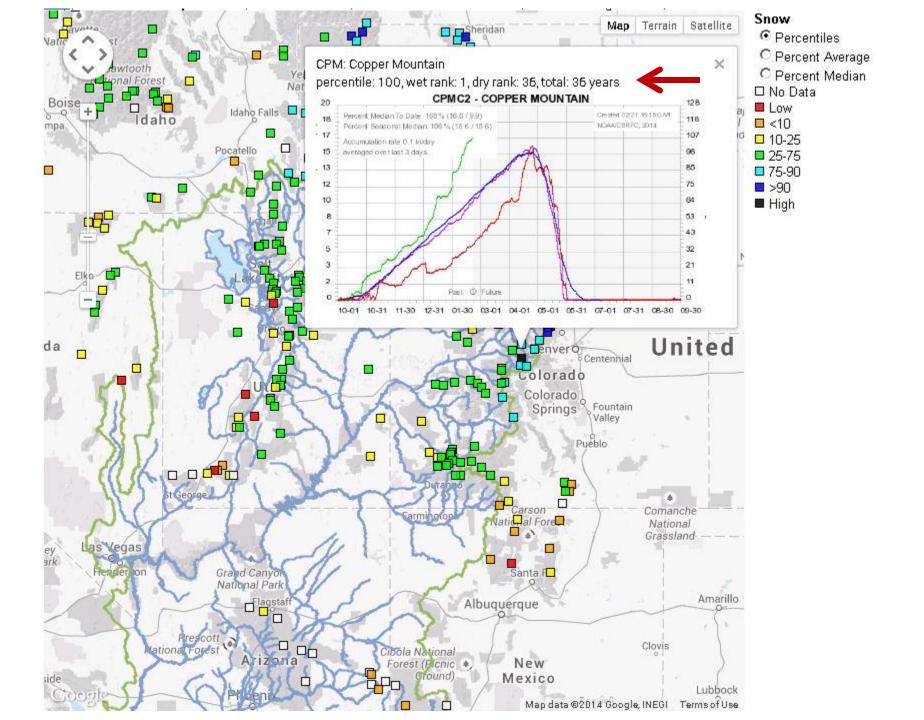
Choose Year: 2014 2013 2012 2011 2010 2009 2008 2007 2006 2005











Green River

Duchesne River (icyu1 wrvu1 stdu1 dstu1 cucu1 trlu1 rcku1 lbnu1 bndu1 lkfu1 fplu1 cwhu1 mmtu1)

Flaming Gorge-North Slope (hewu1 hiru1 hpsu1 scku1)

Green River Basin (kndw4 hmkw4 erdw4 sniw4 kllw4 lopw4 nflw4 trpw4 grw4 scdw4 bgsw4 kgcu1 hpsu1 hiru1 el cwhu1 bndu1 fplu1 lbnu1 btlw4 blsc2 burc2 colc2 crsc2 dvdw4 drlc2 elkc2 lync2 oldw4 resc2 rcpc2 srsw4 towc2 Green abv Fontenelle (sniw4 scdw4 trpw4 bbsw4 erdw4 lopw4 grw4 kndw4 nflw4 ekpw4)

Ham's Fork (kllw4 hmkw4 incw4)

Little Snake (btlw4 dvdw4 oldw4 srsw4 wpkw4)

Price-San Rafael (bufu1 mcdu1 rpru1 seeu1 wrvu1 clcu1 dcpu1)

Upper Green (sniw4 scdw4 trpw4 bbsw4 erdw4 lopw4 grw4 kndw4 nflw4 ekpw4 bgsw4 incw4 kllw4 hmkw4 hewu White (blsc2 burc2 rcpc2 tlsc2)

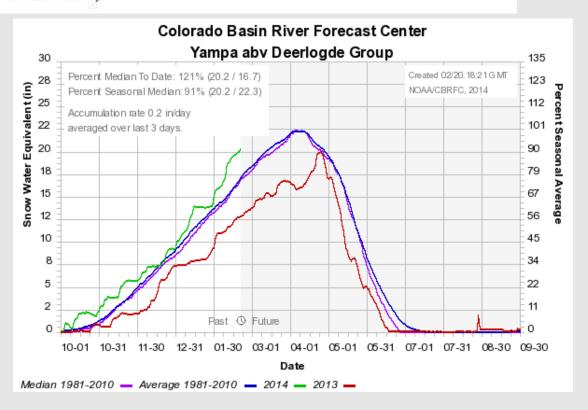
Wind Rivers (bgsw4 ekpw4 kndw4 nflw4)

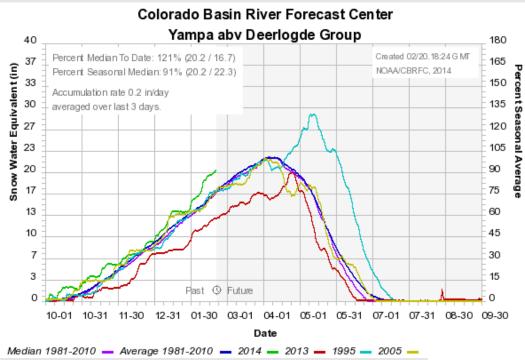
Yampa-White (dvdw4 oldw4 srsw4 btlw4 wpkw4 elkc2 towc2 drlc2 resc2 crsc2 blsc2 burc2 rcpc2 tlsc2)

Yampa abv Deerlogde (dvdw4 oldw4 srsw4 btlw4 wpkw4 elkc2 towc2 drlc2 resc2 crsc2)

Yampa abv Maybell (crsc2 drlc2 elkc2 resc2 towc2)

Snow Groups

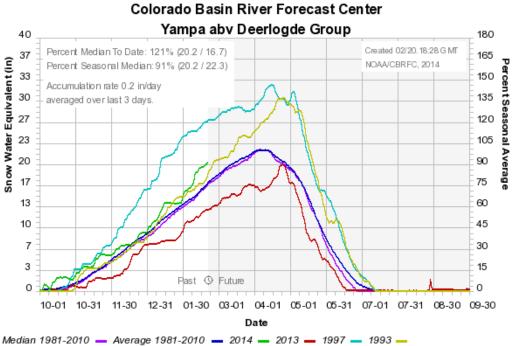




Comparison Ability

closest pattern to current year

maximum years



Make sure you are comparing apples to apples

NVRN5 San Juan Snotel Group Colorado Basin River Forecast Center NVRN5 San Juan Group 30 151 Percent Median To Date: 76% (112 / 14.8) Created 02/21.15:54 G MT 138 NOAA/CBRFC, 2014 Percent Seasonal Median: 56% (11.2 / 19.9) 126 Melt rate -0.0 in/day averaged over last 3 days. 113 101 18 88 15 75 63 12 10 50 38 25 13 Past () Future 10-01 10-31 11-30 12-31 01-30 03-01 04-01 05-01 05-31 07-01 07-31 08-30 09-30 Median 1981-2010 - Average 1981-2010 - 2014 - 2013 -Missing Data Alerts median avq 2014 WCSC2 in 2014 only has 92/144 63% CHAN5 in 2013 only has 224/365 61% Group plots show a simple average of the individual stations Select multiple years and/or stations. Be sure to use your systems key-click combination to avoid inadvertent deselection. Years Data Type

median -

avg

2014

2012

2011

2010

2009

2008

2007

2006

2005

BRTC2 BEARTOWN

CUMC2 CUMBRES TRESTLE

URGC2 UPPER RIO GRANDE

WCSC2 WOLF CREEK SUMMIT

USJC2 UPPER SAN JUAN

AGUU1 AGUA CANYON

CHAN5 CHAMITA

LPDC2 LILY POND

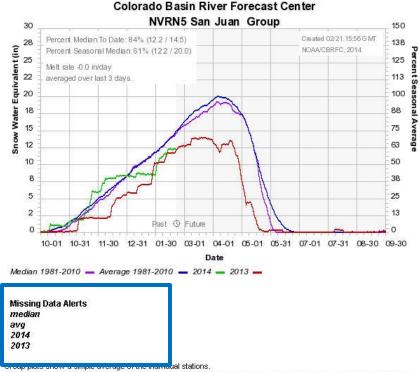
MDLC2 MIDDLE CREEK

STPC2 STUMP LAKES

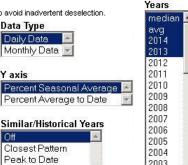
VALC2 VALLECITO

APSC2 APISHAPA

NVRN5 San Juan Snotel Group



Select multiple years and/or stations. Be sure to use your systems key-click combination to avoid inadvertent deselection.



Daily Data

Y axis

Monthly Data 🔻

Closest Pattern

Peak to Date

Stations Data Type Daily Data **BRTC2 BEARTOWN** CUMC2 CUMBRES TRESTLE Monthly Data 🐷 LPDC2 LILY POND MDLC2 MIDDLE CREEK STPC2 STUMP LAKES URGC2 UPPER RIO GRANDE USJC2 UPPER SAN JUAN VALC2 VALLECITO AGUU1 AGUA CANYON

ARPC2 ARAPAHO RIDGE

ATAI1 ATLANTA SUMMIT

BAMME BATEMANI

Y axis Percent Seasonal Average Percent Average to Date

LPDC2 MDLC2 STPC2 URGC2 USJC2 VALC2

BRTC2

CUMC2

Station Links

Similar/Historical Years

Closest Pattern Peak to Date Current Observation

Highest Year

APSC2 APISHAPA AROC2 ARROW

Interface exists to create snow groups

Check existing groups first



HOME **RIVERS** SNOW WATER SUPPLY WEATHER CLIMATE **HELP OFFICE** LINKS SEARCH RESERVOIRS

News

Search Points

Forecast Group

✓ RFC Boundary

CBRFC

Overlays

Rivers

Basins

Snow Sites

No Data

< 7000 ft</p>

No Average

7000-8000 ft

■ 8000-9000 ft

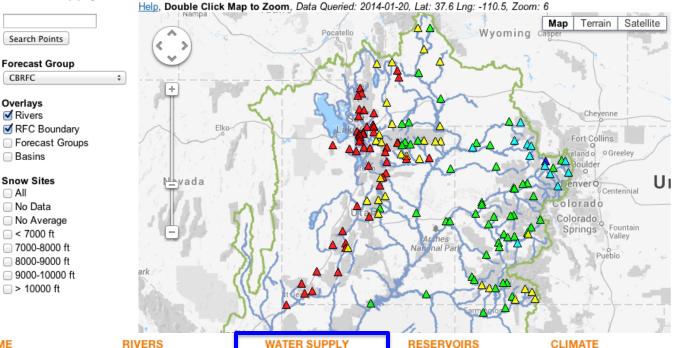
9000-10000 ft

> 10000 ft

□ All

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Water Supply Forecasts



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RIVERS

Conditions Map Conditions List Peak Flow List Peak Flow Archive Recreational Forecasts Text Products 5 Day Flood Outlook Hydro Data AHPS

SNOW

Conditions Map Conditions List Snow Groups

WATER SUPPLY Forecast Map

Forecast List

Temperature

Soil Moisture

Internal Tools

Discussion Publication Publication Archive Specific Site Archive Daily ESP Text Outlooks Documentation Precipitation

Forecast

DamBreak

Observed Text Products Radar Satellite

Legacy

WEATHER

Conditions List

Damcrit

Webcat

General Water Supply Forecasts Peak Forecasts

CLIMATE

Hydroclimatology Climate Change Data and Indicies Forecasts

El Nino and MJO

HELP

OFFICE

News

Email Updates

Water Supply Forecasts

 ESP Percent Average ESP Percent Median

Official

< 70%</p>

△ 70-90% 4 90-110%

▲ >130%

Snow Percentiles

△ 110-130%

Regulated

△ No Forecast

Percent Average

Percent Median

□ No Data

< 25%</p>

25-50%

50-75%

75-90%

90-110% 110-125%

125-150% 150-175% >175%

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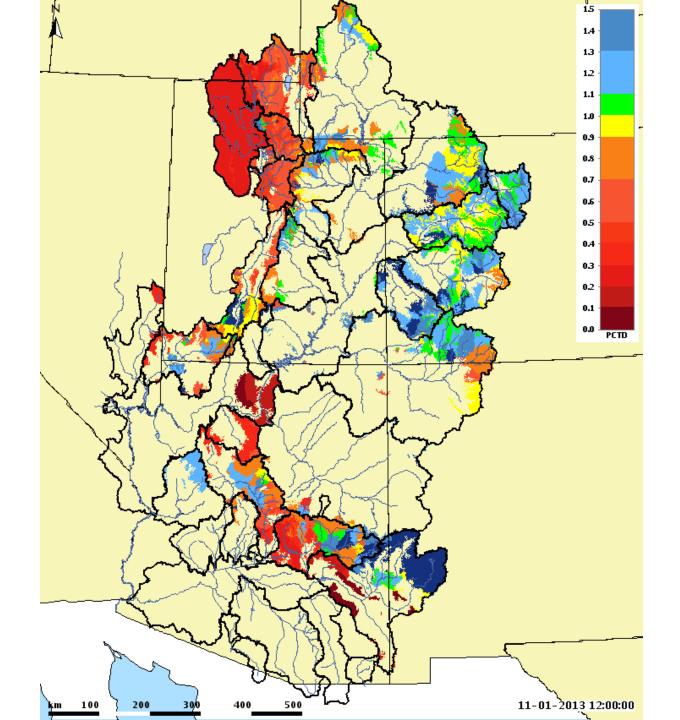
NWS Offices Other Links Wiki

Links

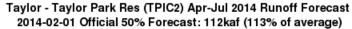
Schedule

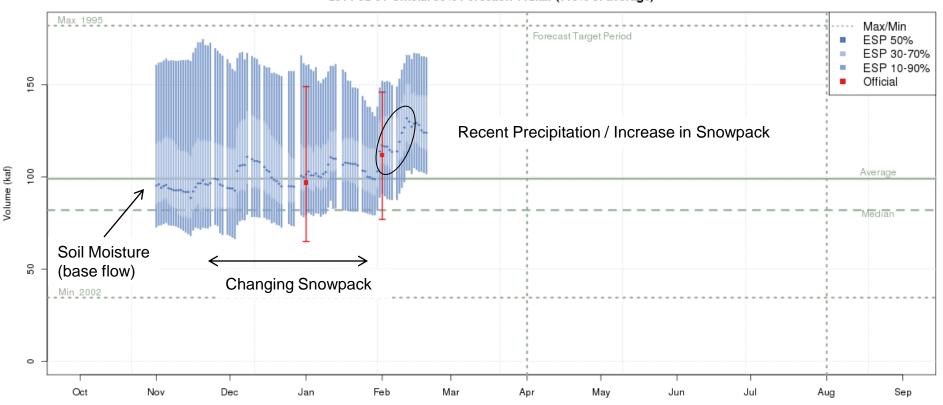
Old SDM

Model Soil Moisture



Tracking basin conditions to explain model trends





Plot Created 2014-02-19 16:14:03, Lastest ESP Run from 2014-02-19, NOAA / NWS / CBRFC Today's 50% ESP forecast changed -0.2 % from yesterday and 8.8 % from February 1 Forecasts in the observed period include observed values.

Colorado Basin River Forecast Center Stakeholder Forum

Beyond The Streamflow Forecast

Seasonal Discussions / Seasonal Trends

Provide water supply forecast discussions

Update more frequently than once/month

Started pushing these out via email subscription

Graphics to summarize basin conditions / trends

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✓ RFC Boundary

CBRFC

Overlays

Rivers

Basins

Snow Sites

No Data

< 7000 ft</p>

No Average

7000-8000 ft

■ 8000-9000 ft

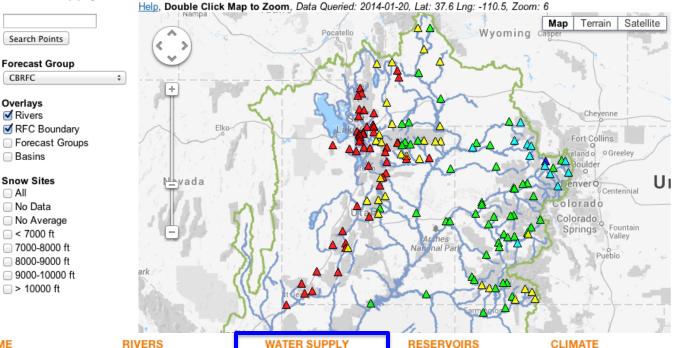
9000-10000 ft

> 10000 ft

□ All

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RIVERS

Conditions Map Conditions List Peak Flow List Peak Flow Archive Recreational Forecasts Text Products 5 Day Flood Outlook Hydro Data AHPS

SNOW

Conditions Map Conditions List Snow Groups

WATER SUPPLY Forecast Map

Forecast List

Temperature

Soil Moisture

Internal Tools

Discussion Publication Publication Archive Specific Site Archive Daily ESP Text Outlooks Documentation Precipitation

Forecast

DamBreak

Observed Text Products Radar Satellite

Legacy

WEATHER

Conditions List

Damcrit

Webcat

General Water Supply Forecasts Peak Forecasts

CLIMATE

Hydroclimatology Climate Change Data and Indicies Forecasts

El Nino and MJO

HELP

OFFICE

News

Email Updates

Water Supply Forecasts

 ESP Percent Average ESP Percent Median

Official

< 70%</p>

△ 70-90% 4 90-110%

▲ >130%

Snow Percentiles

△ 110-130%

Regulated

△ No Forecast

Percent Average

Percent Median

□ No Data

< 25%</p>

25-50%

50-75%

75-90%

90-110% 110-125%

125-150% 150-175% >175%

Information

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Podcasts

Downloads

LINKS

NWS Offices Other Links Wiki

Links

Schedule

Old SDM

Dramatic change in conditions the first 2 weeks of February 2014

Providing updated discussions and daily ESP guidance are ways to keep up on changes between official forecast updates

February 1, 2014 Water Supply Forecast Discussion

The <u>Colorado Basin River Forecast Center (CBRFC)</u> geographic forecast area includes the Upper Colorado River Basin. Lower Colorado River Basin, and Eastern Great Basin.

Seasonal Water Supply Forecasts:

Quick Summary:

Water supply forecasts for the Colorado Basin vary greatly over the area. Above average April-July runoff volumes are expected in the Yampa and the Colorado River above Cameo. Near to above average volumes are forecast for the Gunnison and Upper Green Basins, with slightly below average forecasts in the San Juan Basin. The Lower Colorado River Basin has been very dry and much below average volumes are forecast. The Great Basin is expecting below average volumes. The disparity in snowfall this past month, with most storms reaching the upper Colorado basin from the northwest, and bypassing the rest of the CBRFC's area, combined with widely varying soil moisture conditions had the greatest impact on this month's forecast updates.

February 19, 2014 Water Supply Forecast Discussion Update

The <u>Colorado Basin River Forecast Center (CBRFC)</u> geographic forecast area includes the Upper Colorado River Basin, Lower Colorado River Basin, and Eastern Great Basin.

Seasonal Water Supply Forecasts:

Summary:

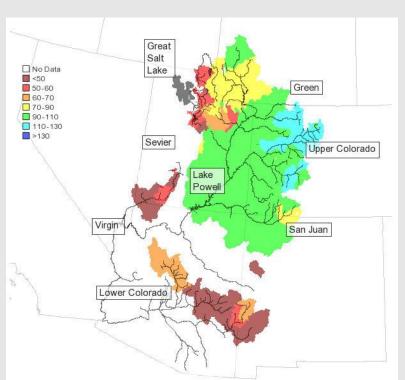
Since the beginning of February, several storms produced significant amounts of snow in the Upper Green River Basin. Some locations received 6 inches of water during the first half of February which is 300-400 percent of average.

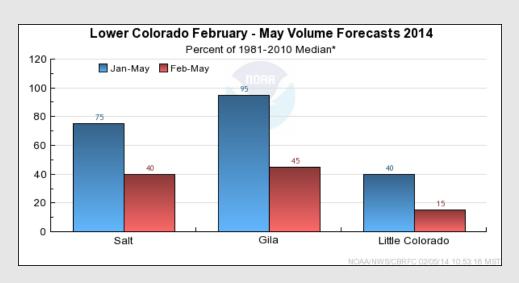
The Colorado River Headwaters, northern Great Basin, and upper Gunnison River Basin also experienced a significant increase in snow. Precipitation in these areas ranged from 150 to over 200 percent of average through mid February.

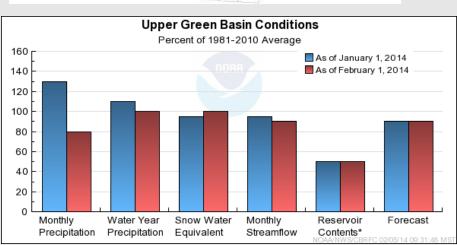
The map below shows percent of average April through July forecast volume based on the CBRFC guidance model, as of February 18th. Significant increases occurred in the areas aforementioned. Model guidance as of mid February indicates April-July volumes in the 120 to 150 percent of average range in the upper Gunnison, Colorado River Headwaters and upper Green Basin. As of mid February the Fontenelle inflow forecast is for 950 KAF (130% of average), Blue Mesa Inflow is 815 KAF (121% of average), and Lake Powell Inflow 7.7 MAF (108% of average).

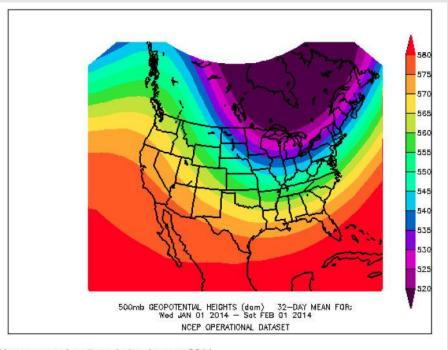
Help, Double Click Map to Zoom, Data Queried: February 14 2014, Lat: 37.6 Lng: -110.5, Zoom: 6

Graphics to help describe the situation









Mean upper air pattern during January 2014.

Colorado Basin River Forecast Center Stakeholder Forum

Beyond The Streamflow Forecast

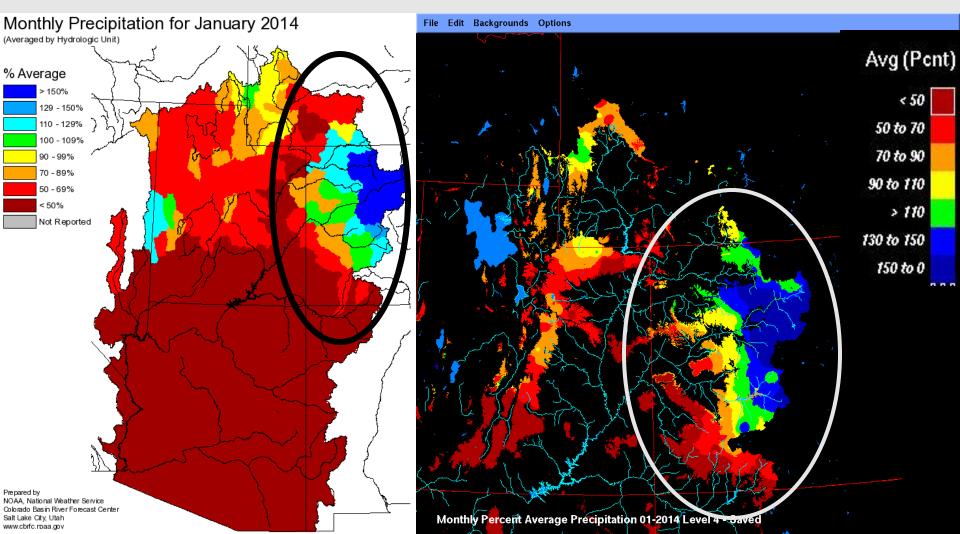
What is the most pertinent information and how can we best provide it?

How do we keep it simple to access yet informative?

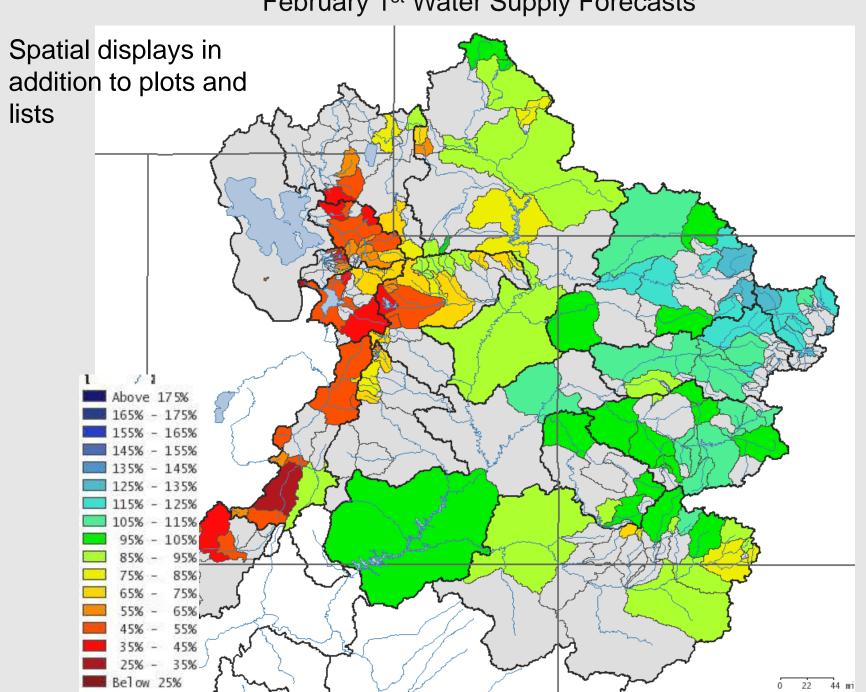
How useful is the information we currently provide?

Refocus on what is important: Areas that are primary contributors to seasonal runoff

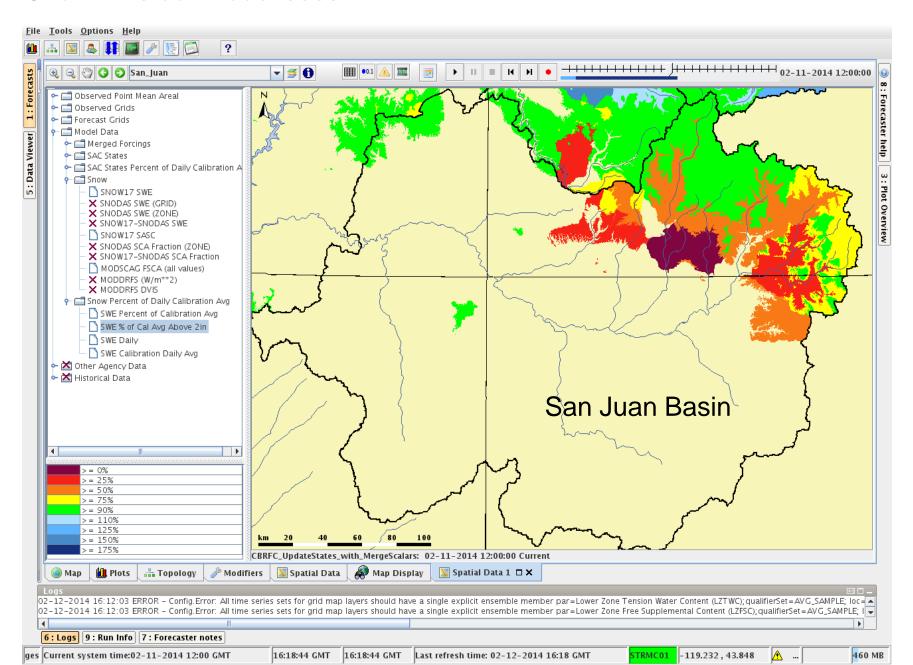
January 2014 Precipitation – contributing areas areas



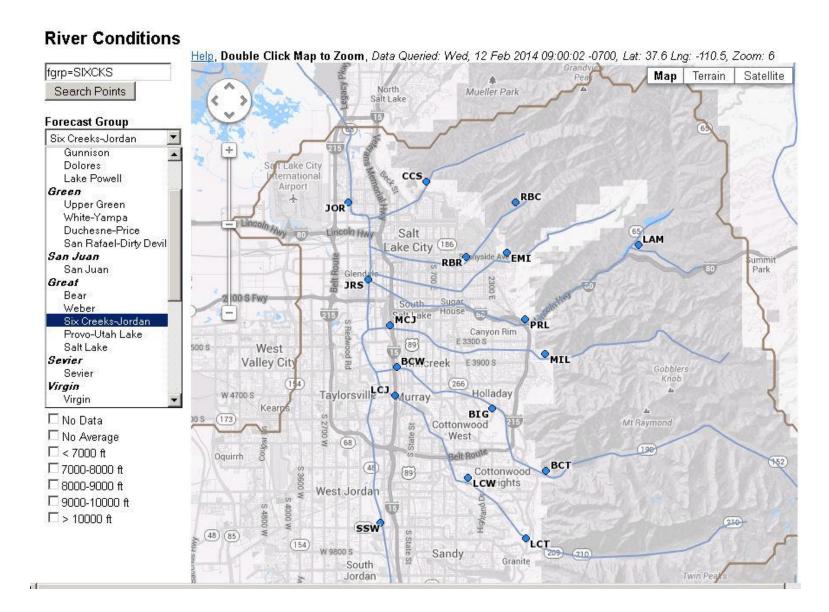
February 1st Water Supply Forecasts



Snow – As our model sees it



Obtain Information by River Basin



Colorado Basin River Forecast Center Stakeholder Forum

Simple Text Format – Pushed Via Email

<u>F</u> ile <u>E</u> dit <u>S</u> earch <u>P</u> references SI	he <u>l</u> l Ma <u>c</u> ro	<u>W</u> ind	ows				<u>H</u> elp	
San Juan River Basin								Δ
	Period	MP	MP≋	RMAX	RMIN	AVG		
Con Toom Pinner								
San Juan River	3 mm - Tan 1	197	92	265	131	215		
Pagosa Springs Carracas, nr	Apr-Jul Apr-Jul	320	94 84	460	215	380		
Rio Blanco River	Hpr-Jur	320	04	400	213	300		
Pagosa Springs, nr, Blanco Dam	Apr-Jul	47	87	65	34	54		
Navajo River	mpr our	• •	٠.		٠.	٠.		
Chromo, nr, Oso Div Dam, blo	Apr-Jul	55	85	78	37	65		
Piedra River	•							
Arboles, nr	Apr-Jul	210	100	270	137	210		
Los Pinos River	-							
Vallecito Res, Bayfield, nr	Apr-Jul	205	106	250	137	194		
San Juan River	_							
Navajo_Res, Archuleta, nr	Apr-Jul	660	90	950	410	735		П
Florida River			0.4	70	40			П
Lemon Res, Durango, nr	Apr-Jul	50	91	70	40	55		П
Animas River	Acces Tool	415	100	530	305	415		П
Durango San Juan River	Apr-Jul	415	100	530	305	415		П
Farmington	Apr-Jul	1020	, 93	1430	660	1100		П
La Plata River	npr-our	1020	^ 23	1430	000	1100		П
Hesperus	Apr-Jul	18.0	78	27	11.0	23		П
San Juan River	P	20.0						
Bluff, nr	Apr-Jul	1000	91	1420	635	1100		
Mancos River	•							
Mancos, nr	Apr-Jul	22	71	34	10.0	31		
								V
ব							15	7

Colorado Basin River Forecast Center Stakeholder Forum

Beyond The Streamflow Forecast

What is the most pertinent information and how can we best provide it?

How do we keep it simple to access yet informative?

How useful is the information we currently provide?